

Claims

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1. Apparatus for enabling more than one communicative process to be carried on at the same time via a single telephone line, comprising:

3 a network interface means for connecting to a telecommunications
4 network;

5 a telephone interface means for connecting to at least one
6 telephone;

7 a computer interface means for connecting to at least one computer;
8 an internetwork protocol (IP) routing means communicatively
9 connected to said respective interface means for managing the addressing
10 of data between said network and either or both of said telephone and said
11 computer; and

12 a voice circuit for receiving and converting data routed from said IP
13 routing means to said telephone, and for converting and feeding voice
14 signals input from said telephone to said IP routing means;

15 wherein said IP routing means selectively routes voice and data
16 signals from said telephone and said computer, respectively, to and from
17 said telecommunications network via said telephone line.

1 2. Apparatus of claim 1, further comprising:

2 a voice over IP gateway means for packetizing voice signals
3 received from said telephone interface and depacketizing voice signals
4 from said IP routing means, packetized signals being routed by said IP
5 routing means for transmission to said telecommunications network and
6 depacketized voice signals being routed to said telephone interface for
7 establishing a telephone conversation between a caller using said

8 telephone and an other caller connected to said telecommunications
9 network via an other telephone.

1 3. Apparatus of claim 1, further comprising:
2 address conversion and translation means for translating the
3 respective addresses of said telephone and computer to correspond with
4 an address of said telephone line assigned to communicate with said
5 telecommunications network.

1 4 Apparatus of claim 1, further comprising:
2 a packet prioritization module for setting respective priorities for
3 voice and data signals.

1 5. Apparatus of claim 4, wherein said packet prioritization module
2 further prioritizes voice signals over data signals so that voice signals take
3 precedent over data signals when both voice and data signals are being
4 communicated between said apparatus and said telecommunications
5 network using said telephone line.

1 6. Apparatus of claim 1, wherein said IP routing means apportions the
2 bandwidth of said telephone line for selectively routing the voice signals
3 and data signals between said telephone and computer, respectively, and
4 said telecommunications network.

1 7. Apparatus of claim 1, wherein said voice circuit comprises:
2 a voice over IP gateway;

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3 an analog to digital converter for converting voice signals from said
4 telephone into digital signals for routing to said gateway;

5 a digital to analog converter for converting digital signals received
6 from said gateway into voice signals to be routed to said telephone;

7 a ring generator for ringing said telephone when a voice signal is
8 received at said gateway;

9 a dual tone multi-frequency (DTMF) generator for generating an
10 address whereto a voice signal from said telephone is to be routed; and

11 a dial tone generator for generating a dial tone for said telephone
12 when said telephone is taken off hook.

13 8. Apparatus of claim 1, further comprising:

14 a dual tone multi-frequency (DTMF) generator;

15 a call forward management module working cooperatively with said
16 network interface means for forwarding a call to either said telephone or
17 said computer; and

18 a message waiting light for informing a user that a voice call has
19 been received and forwarded by said call forward management module to
20 said telephone.

21 9. A communications controller to be used at a site to connect to a
22 telecommunications network, said site including at least one telephone and
23 one computer both adaptable to be accessible to said telecommunications
24 network, said communications controller comprising:

25 at least one out site interface means for effecting a connection with
26 said telecommunications network via a telephone line;

27 at least one in site interface means for establishing a connection
28 with said telephone;

29 at least an other in site interface means for establishing a connection
30 with said computer; and

31 an internetwork protocol (IP) routing means communicatively
32 connected to said respective interface means for selectively routing voice
33 signals and data signals between said telephone and computer,
34 respectively, and said telecommunications network so that both voice and
35 data signals are simultaneously communicated between said site and said
36 telecommunications network using said telephone line.

1 10. Communications controller of claim 9, further comprising:

2 address conversion and translation means for assigning respective
3 in site addresses for said telephone and computer, and correlating said
4 respective in site addresses with an out site address of said telephone line
5 assigned by said telecommunications network; and

6 wherein said IP routing means selectively routes the voice and data
7 signals between said telephone and computer, respectively, and said
8 telecommunications network by establishing respective connections
9 between said out site address and said respective in site addresses of said
10 telephone and said computer so that both voice and data signals can be
11 exchanged between said telephone and said computer connected to said
12 communications controller and devices communicatively connected to said
13 telecommunications network.

1 11. Communications controller of claim 9, further comprising:

2 a voice circuit communicatively connected to said telephone and
3 said IP routing means for receiving and converting digital voice signals
4 routed from said IP routing means into analog voice signals for said
5 telephone, and converting and feeding analog voice signals input from said
6 telephone into digital voice signals for said IP routing means.

1 12. Communications controller of claim 9, wherein said voice circuit
2 comprises:

3 a voice over IP gateway;
4 an analog to digital converter for converting voice signals from said
5 telephone into digital signals for routing to said gateway;
6 a digital to analog converter for converting digital signals received
7 from said gateway into voice signals to be routed to said telephone;
8 a ring generator for ringing said telephone when a voice signal is
9 received at said gateway;
10 a dual tone multi-frequency (DTMF) generator; and
11 a dial tone generator for generating dial tone for said telephone
12 when said telephone is taken off hook.

1 13. Communications controller of claim 9, further comprising:

2 a voice over IP gateway means for packetizing voice signals
3 received from said one in site interface means and depacketizing voice
4 signals received from said IP routing means, packetized voice signals
5 being routed by said IP routing means for transmission to said
6 telecommunications network and depacketized voice signals being routed
7 to said one in site interface means for establishing a telephone connection

8 between a caller using said telephone and an other caller connected to
9 said telecommunications network via an other telephone.

1 14. Communications controller of claim 9, further comprising:
2 address conversion and translation means for translating the
3 respective addresses of said telephone and computer to correspond with
4 an address of said telephone line assigned to communicate with said
5 telecommunications network.

1 15. Communications controller of claim 9, wherein said IP routing means
2 apportions the bandwidth of said telephone line for selectively routing the
3 voice signals and data signals between said telephone and computer,
4 respectively, and said telecommunications network.

1 16. Communications controller of claim 13, further comprising:
2 a packet prioritization module for setting respective priorities for
3 voice and data signals, said packet prioritization module prioritizing voice
4 signals over data signals so that voice signals take precedent over data
5 signals when both voice and data signals are being communicated
6 between said site and said telecommunications network using said
7 telephone line.

1 17. A method of utilizing one telephone line at a site to simultaneously
2 effect at least voice and data communication with a telecommunications
3 network, comprising the steps of:

4 a) connecting at least one out site interface means to said one
5 telephone line for effecting a connection with said telecommunications
6 network;

7 b) connecting at least one telephone to at least one in site interface
8 means for establishing a connection with said telephone;

9 c) connecting at least one computer to an other in site interface
10 means for establishing a connection with said computer; and

11 d) communicatively connecting an internetwork protocol (IP) routing
12 means to said respective interface means for selectively routing voice
13 signals and data signals between said telephone and computer,
14 respectively, and said telecommunications network so that both voice and
15 data signals are simultaneously communicated between said site and said
16 telecommunications network using said telephone line.

1 18. Method of claim 17, wherein said IP routing means apportions the
2 bandwidth of said telephone line for selectively routing the voice signals
3 and data signals between said telephone and computer, respectively, and
4 said telecommunications network.

1 19. Method of claim 17, wherein said step d further comprises the step
2 of:

3 prioritizing voice signals over data signals so that voice signals take
4 precedent over data signals when both voice and data signals are being
5 communicated between said site and said telecommunications network
6 using said telephone line.

1 20. Method of claim 17, further comprising the steps of:

2 assigning respective in site addresses for said telephone and
3 computer and correlating said respective in site addresses with an out site
4 address of said telephone line assigned by said telecommunications
5 network; and

6 establishing respective connections between said out site address
7 and said respective in site addresses of said telephone and computer for
8 selectively routing the voice and data signals between said telephone and
9 computer, respectively, and said telecommunications network to thereby
10 exchange both voice and data signals between said telephone and said
11 computer and devices communicatively connected to said
12 telecommunications network.

1 21. Method of claim 17, further comprising the step of:

2 communicatively connecting a voice circuit to said telephone and
3 said IP routing means for receiving and converting digital voice signals
4 routed from said IP routing means into analog voice signals for said
5 telephone, and converting and forwarding analog voice signals output from
6 said telephone into digital voice signals for said IP routing means.

1 22. Method of claim 17, further comprising the steps of:

2 converting analog voice signals from said telephone into digital voice
3 signals for routing to a voice over IP gateway;

4 converting digital voice signals received from said gateway to analog
5 voice signals to be routed to said telephone;

6 ringing said telephone when a voice signal is received at said
7 gateway; and

8 generating a dial tone for said telephone when said telephone is
9 taken off hook.

1 23. Method of claim 17, further comprising the step of:
2 packetizing voice signals received from said one in site interface
3 means and depacketizing voice signals from said IP routing means,
4 packetized signals being routed by said IP routing means for transmission
5 to said telecommunications network and depacketized voice signals being
6 routed to said one in site interface means for establishing a telephone
7 connection between a caller using said telephone and an other caller
8 connected to said telecommunications network via an other telephone.

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